

What is claimed is:

1. An intelligent assist device comprising:
an overhead motorized moveable trolley;
a support that extends downwardly from the trolley to a payload;
a sensor operatively coupled to the support to sense a characteristic of motion imparted by a human operator to the device; and
a controller operatively coupled with the sensor and the trolley, the controller controlling movements of the trolley, the controller estimating an amount of oscillation in the support that does not correspond to the motion imparted by the human operator and adjusting movements of the trolley based thereon.
2. The intelligent assist device of claim 1, wherein the sensor comprises a cable angle sensor that senses an angle at which the support extends from the trolley.
3. The intelligent assist device of claim 1, wherein the sensor comprises a force sensor that senses a force imparted by the human operator to the device.
4. The intelligent assist device of claim 1, wherein the controller filters at least a portion of signals from the sensor that are indicative of the oscillation in the support.
5. The intelligent assist device of claim 4, wherein the controller comprises a low pass filter and a band pass filter.
6. The intelligent assist device of claim 5, wherein the low pass filter comprises a cut-off frequency of about 0.5 Hz.
7. The intelligent assist device of claim 5, wherein the band pass filter comprises a low cut-off frequency of about 1.5 Hz and a high cut-off frequency of about 5.0 Hz.
8. The intelligent assist device of claim 5, wherein the controller further comprises at least one rectifier configured to rectify the signals.
9. The intelligent assist device of claim 8, wherein the controller further comprises a second low pass filter.
10. The intelligent assist device of claim 9, wherein the second low pass filter comprises a cut-off frequency of about 0.5 Hz.
11. The intelligent assist device of claim 1, wherein the support comprises a cable.
12. The intelligent assist device of claim 1, wherein the support comprises a chain.

13. The intelligent assist device of claim 1, wherein the support comprises a rigid descender.
14. The intelligent assist device of claim 1, wherein the motion is imparted by the human operator to the payload and hence to the device through the support.
15. A method for controlling movement of an overhead moveable trolley in an intelligent assist device, the method comprising:
 - sensing a characteristic of motion imparted by a human operator to the device;
 - estimating an amount of oscillation in the device that does not correspond to the motion imparted by the human operator; and
 - adjusting movements of the trolley based upon the estimate.
16. The method of claim 15, wherein estimating the amount of oscillation comprises measuring the amount of oscillation in the device that does not correspond to the motion imparted by the human operator.
17. The method of claim 15, wherein sensing the characteristic of motion imparted by the human operator comprises sensing an angle at which a payload support extends from the trolley.
18. The method of claim 15, wherein sensing the characteristic of motion imparted by the human operator comprises sensing a force imparted by the human operator to the device.
19. The method of claim 15, wherein estimating the amount of oscillation comprises filtering at least a portion of signals generated from sensing the characteristic of motion imparted by the human operator.
20. The method of claim 19, wherein filtering the signals comprises passing the signals through a low pass filter and a band pass filter.
21. The method of claim 20, wherein the low pass filter comprises a cut-off frequency of about 0.5 Hz.
22. The method of claim 20, wherein the band pass filter comprises a low cut-off frequency of about 1.5 Hz and a high cut-off frequency of about 5.0 Hz.
23. The method of claim 19, wherein estimating the amount of oscillation further comprises passing the signals through a rectifier.

24. The method of claim 23, wherein estimating the amount of oscillation further comprises passing the signals through a second low pass filter.

25. The method of claim 24, wherein the second low pass filter comprises a cut-off frequency of about 0.5 Hz.

26. The method of claim 15, wherein adjusting the movements of the trolley comprises reducing a feedback gain when the amount of oscillation in the device that does not correspond to the motion imparted by the human operator exceeds a threshold level.

27. The method of claim 15, wherein the motion is imparted by the human operator to a payload and hence to the device through a support that extends downwardly from the trolley to the payload.

28. A method for controlling movement of an overhead moveable trolley in an intelligent assist device, the method comprising:

- sensing tension in a cable that extends downwardly from the trolley to a payload;
- controlling the trolley based on the sensed tension;

- determining when changes in the sensed tension are below a threshold level; and

- adjusting movements of the trolley based upon the changes in the sensed tension that are below the threshold level.

29. The method of claim 28, wherein determining when changes in the sensed tension are below the threshold value comprises filtering a signal representing the sensed tension.

30. The method of claim 29, wherein filtering the signal comprises passing the signal through a low pass filter.

31. The method of claim 30, wherein the low pass filter comprises a cut-off frequency of about 1 Hz.

32. The method of claim 28, wherein adjusting movements of the trolley comprises stopping the trolley.

33. An intelligent assist device comprising:

- an overhead motorized moveable trolley;

- a support that extends downwardly from the trolley to a payload;

- a sensor operatively coupled to the support to sense a characteristic of motion imparted by a human operator to the device; and

a controller operatively coupled with the sensor and the trolley, the controller controlling movements of the trolley, the controller identifying oscillations in the support above a threshold level and adjusting movements of the trolley based thereon.

34. A method for controlling movement of an overhead moveable trolley in an intelligent assist device, the method comprising:

- sensing a characteristic of motion imparted by a human operator to the device;
- identifying oscillations in the device above a threshold level; and
- adjusting movements of the trolley based upon the identification.